

NOTES AND REVIEWS

THOMAS A. BLAIR. **Weather Elements—A Text in Elementary Meteorology.** Revised Edition. New York (Prentice-Hall, Inc.), 1942.

The scope and character of this book are indicated in the review of the first edition that appeared in the MONTHLY WEATHER REVIEW for December 1937, p. 447.

This new edition represents a limited revision, in which numerous additions and modifications have been introduced without any change in the general character of the book.

V. CONRAD. *Fundamentals of Physical Climatology*. Harvard University, Blue Hill Meteorological Observatory, 1942. 121 pp., 60 figs.

This book is a semi-technical discussion, from the climatological viewpoint, of the principal physical factors that influence the climatological characteristics of different regions of the earth—the radiation balance of the atmosphere, the general temperature distribution over the globe, lapse rates in the atmosphere, transfer of heat horizontally and vertically, atmospheric and oceanic circulations, humidity, clouds, and precipitation.

OSCAR E. MEINZER, editor. **Hydrology (Physics of the Earth—IX).**
New York (McGraw Hill Book Co.) 1942.

This treatise completes the series on geophysics planned

in 1926 by the National Research Council, the earliest volumes of which were published in 1931. The volume on Hydrology has been in preparation since 1936, and is the work of 24 authors; it fills 712 large pages, and includes many diagrams and photographs, and extensive bibliographic lists.

All phases of the hydrologic cycle are covered. After an introductory chapter (which includes an interesting section on the historical development of hydrologic concepts from ancient times to the present), the basic processes of precipitation and evaporation are discussed. These chapters are followed by a treatment of the numerous phenomena involved in the natural storage and transfer of water during the hydrologic cycle—snow cover, ice, glaciers, lakes and swamps; infiltration of surface water into the ground, transpiration, soil moisture and its movements, ground water and its flow and discharge by springs and in other ways, runoff and river flow, floods and droughts. The closing group of chapters are devoted to the physical and chemical work done by natural waters—erosion, transport and deposition, solution and leaching—and to a special discussion of the hydrology of limestone and volcanic terrains.

METEOROLOGICAL AND CLIMATOLOGICAL DATA FOR JUNE 1942

[Climate and Crop Weather Division, J. B. KINCER, in charge]

AEROLOGICAL OBSERVATIONS

TABLE 1.—Mean free-air barometric pressure in millibars, temperature in degrees Centigrade, and relative humidities in percent obtained by airplanes and radiosondes during June 1942

TABLE 1.—Mean free-air barometric pressure in millibars, temperature in degrees Centigrade, and relative humidities in percent, obtained by airplanes and radiosondes during June 1942—Continued

Altitude (meters) m.s.l.	Stations and elevations in meters above sea level																							
	Charleston, S. C. (14 m.)			Denver, Colo. (1,616 m.)			Detroit, Mich. (194 m.)			El Paso, Tex. (1,193 m.)			Ely, Nev. (1,908 m.)			Great Falls, Mont. (1,128 m.)			Huntington, W. Va. (172 m.)					
	Number of ob- servations	Pressure	Temperature	Number of ob- servations	Pressure	Temperature	Number of ob- servations	Pressure	Temperature	Number of ob- servations	Pressure	Temperature	Number of ob- servations	Pressure	Temperature	Number of ob- servations	Pressure	Temperature	Number of ob- servations	Pressure	Temperature			
Surface	30	1,014	23.6	92	30	837	16.4	68	30	991	17.4	87	30	878	28.7	22	30	799	17.2	29	30	798	8.5	
500.	30	960	22.7	80	30	837	16.4	68	30	956	18.8	67	30	878	28.7	22	30	753	14.7	29	30	751	5.0	
1,000.	30	906	20.0	75	30	837	16.4	68	30	902	16.5	68	30	878	28.7	22	30	710	10.5	30	30	706	1.4	
1,500.	30	855	17.1	74	30	837	16.4	68	30	850	13.7	67	30	848	28.4	22	30	706	16.7	30	30	706	5.0	
2,000.	30	806	14.2	71	30	800	16.2	61	30	801	11.0	64	30	801	25.0	22	30	799	17.2	29	30	798	8.5	
2,500.	30	759	11.2	66	30	754	13.4	58	30	754	8.4	59	30	756	20.8	22	30	753	14.7	29	30	751	5.0	
3,000.	30	715	8.5	62	30	710	10.2	59	30	709	5.7	56	30	713	16.7	22	30	706	10.5	30	30	706	1.4	
4,000.	30	633	2.9	59	30	629	3.4	59	29	627	0.2	50	30	633	8.4	24	30	628	2.3	34	30	623	-4.8	
5,000.	30	559	-2.7	57	30	555	-4.4	59	29	553	-5.8	49	30	560	0.1	28	30	554	-5.7	36	30	548	-11.5	
6,000.	30	492	-8.2	53	30	488	-12.0	55	28	486	-11.3	43	29	493	-7.4	22	30	487	-13.1	37	30	480	-18.4	
7,000.	28	432	-14.5	53	29	427	-19.2	52	28	426	-17.9	41	29	433	-14.0	22	30	427	-20.1	35	30	419	-25.5	
8,000.	25	378	-21.2	52	29	373	-26.4	46	28	372	-25.0	40	29	379	-20.6	28	30	372	-28.1	34	29	364	-32.9	
9,000.	23	329	-28.4	51	26	324	-33.9	45	28	324	-32.0	38	29	330	-28.1	26	29	322	-35.6	34	29	315	-39.7	
10,000.	22	286	-36.2	50	25	280	-41.6	46	27	280	-39.5	39	28	287	-35.8	24	28	279	-42.7	29	27	272	-45.9	
11,000.	21	247	-43.8	46	25	241	-49.0	49	27	242	-46.4	44	28	248	-43.4	22	28	240	-48.8	29	234	-50.2	24	
12,000.	21	212	-51.0	46	23	207	-55.6	52	27	207	-52.8	44	27	213	-50.4	27	27	206	-53.7	28	200	-52.4	24	
13,000.	21	182	-57.7	46	23	176	-59.2	52	26	177	-58.2	44	26	182	-55.5	25	26	176	-57.5	28	172	-52.1	24	
14,000.	21	155	-62.3	46	22	150	-61.0	52	25	151	-61.7	44	25	156	-60.2	22	22	150	-59.5	27	147	-52.1	24	
15,000.	20	131	-65.7	46	22	128	-63.0	52	24	129	-60.6	44	25	133	-64.1	21	21	127	-61.2	27	126	-52.8	24	
16,000.	20	112	-67.7	46	22	109	-64.6	52	19	109	-61.6	44	24	112	-67.8	20	20	109	-62.4	27	108	-53.9	23	
17,000.	19	94	-67.6	46	19	92	-64.6	52	17	93	-62.1	44	19	95	-70.4	19	19	92	-54.6	26	92	-54.6	18	
18,000.	11	80	-66.8	46	15	78	-62.0	52	13	79	-61.0	44	17	80	-69.2	16	16	78	-62.1	19	79	-54.3	16	
19,000.	8	67	-60.6	46	5	68	-59.5	44	14	68	-65.4	44	6	66	-60.7	5	5	68	-53.7	11	67	-62.2	5	
20,000.										8	68	-60.5		8	68	-60.5		5	58	-53.4	5	57	-59.8	

Altitude (meters) m.s.l.	Stations and elevations in meters above sea level																						
	Joliet, Ill. (178 M.)			Lake Charles, La. (6 m.)			Lakehurst, N. J. ¹ (39 m.)			Medford, Oreg. (401 m.)			Miami, Fla. (4 M.)			Nashville, Tenn. (180 m.)			Norfolk, Va. ¹ (4 m.)				
	Number of ob- servations	Pressure	Temperature	Relative humid- ity	Number of ob- servations	Pressure	Temperature	Relative humid- ity	Number of ob- servations	Pressure	Temperature	Relative humid- ity	Number of ob- servations	Pressure	Temperature	Number of ob- servations	Pressure	Temperature	Number of ob- servations	Pressure	Temperature	Relative humid- ity	
Surface	28	994	19.0	84	29	1,012	25.0	90	30	1,011	19.0	82	30	968	19.3	49	30	1,016	25.2	72	29	1,016	23.8
500.	28	957	20.0	75	29	956	23.5	78	30	959	18.8	64	30	957	18.8	49	30	957	23.3	66	29	960	21.7
1,000.	28	903	17.6	74	29	903	21.5	67	30	905	16.5	59	30	902	15.7	50	30	906	20.4	78	30	904	19.2
1,500.	28	852	14.7	73	29	853	19.1	62	30	853	13.8	62	30	850	12.0	56	30	855	17.5	75	30	853	16.1
2,000.	28	802	12.1	69	28	804	16.4	55	30	803	11.2	60	30	800	8.3	66	30	806	14.7	72	30	804	13.4
2,500.	28	756	9.6	62	28	758	13.8	49	30	756	8.7	57	30	753	5.3	87	30	760	11.8	69	30	758	12.1
3,000.	28	711	7.0	58	28	714	10.8	49	30	712	6.0	52	30	708	2.8	62	30	716	9.0	68	30	714	6.5
4,000.	28	630	1.4	53	28	632	4.8	50	30	626	1.2	46	29	626	-2.5	49	29	634	2.9	67	30	633	3.4
5,000.	28	556	-4.5	56	27	559	-1.2	47	30	555	-4.5	44	28	551	-8.5	48	29	560	-2.5	68	30	559	-3.3
6,000.	27	488	-10.8	54	27	492	-7.5	43	30	488	-10.2	38	27	484	-14.8	46	29	493	-7.9	67	30	492	-8.0
7,000.	27	429	-17.5	52	26	432	-13.9	39	30	428	-16.6	35	27	424	-21.6	44	27	433	-13.8	66	30	432	-14.1
8,000.	26	374	-24.4	51	26	378	-20.8	36	30	374	-23.6	34	26	368	-28.8	43	26	379	-20.3	63	29	378	-20.9
9,000.	26	325	-31.5	50	25	329	-27.9	35	30	325	-30.7	33	26	320	-35.8	43	25	330	-27.4	63	29	329	-27.8
10,000.	26	282	-38.8	48	25	286	-35.4	36	30	283	-38.3	33	24	277	-42.5	44	25	287	-35.0	62	27	286	-35.3
11,000.	26	243	-46.0	46	24	247	-42.9	44	29	244	-45.8	44	24	238	-48.9	44	24	248	-42.8	44	26	248	-43.2
12,000.	25	208	-52.7	46	23	213	-50.3	44	29	210	-53.0	44	24	204	-53.5	43	23	213	-50.7	44	26	213	-50.8
13,000.	25	178	-58.2	46	22	182	-57.1	44	29	179	-59.2	44	24	174	-54.8	43	23	183	-57.5	44	26	182	-57.8
14,000.	25	152	-61.3	46	20	155	-62.6	45	25	153	-62.5	44	23	149	-55.3	43	23	156	-63.3	44	26	155	-62.7
15,000.	24	129	-61.9	46	18	131	-67.4	44	16	130	-61.7	44	21	128	-55.4	42	22	132	-68.1	44	25	132	-65.1
16,000.	24	110	-62.3	46	17	111	-72.0	44	9	110	-63.1	44	20	109	-56.2	42	22	112	-70.8	44	25	112	-66.9
17,000.	21	93	-62.5	46	16	9																	

TABLE 1.—Mean free-air barometric pressure in millibars, temperature in degrees Centigrade, and relative humidities in percent obtained by airplanes and radiosondes during June 1942—Continued

Altitude (meters) m. s. l.	Stations and elevations in meters above sea level																		St. Louis, Mo. (171 m.)										
	Oakland, Calif. (2 m.)				Oklahoma City, Okla. (391 m.)				Omaha, Nebr. (301 m.)				Pensacola, Fla. ¹ (24 m.)				Phoenix, Ariz. (339 m.)				Portland, Maine, (20 m.)				St. Louis, Mo. (171 m.)				
	Number of ob- servations	Pressure	Temperature	Relative humid- ity	Number of ob- servations	Pressure	Temperature	Relative humid- ity	Number of ob- servations	Pressure	Temperature	Relative humid- ity	Number of ob- servations	Pressure	Temperature	Relative humid- ity	Number of ob- servations	Pressure	Temperature	Relative humid- ity	Number of ob- servations	Pressure	Temperature	Relative humid- ity	Number of ob- servations	Pressure	Temperature	Relative humid- ity	
Surface	30	1,013	16.0	74	30	966	23.2	81	30	978	20.9	77	26	1,012	23.1	80	26	967	29.3	21	1,012	14.2	91	30	994	21.8	82		
500	30	956	16.5	63	30	954	23.3	72	30	956	21.2	72	26	958	22.1	69	26	950	33.1	16	956	16.8	71	30	956	22.1	82		
1,000	30	902	18.2	38	30	901	21.8	72	30	902	19.1	69	26	898	20.2	65	26	898	30.5	18	902	14.8	71	30	903	19.3	70		
1,500	30	850	16.0	32	30	851	19.0	71	30	852	16.0	71	26	844	17.4	62	26	849	26.4	16	850	11.9	75	26	852	16.3	72		
2,000	30	801	13.8	29	30	802	16.8	64	30	802	13.2	68	26	805	14.7	57	26	802	22.1	16	803	9.1	75	26	803	14.1	63		
2,500	30	755	11.0	27	30	756	14.5	56	30	756	10.8	64	26	758	11.8	53	30	756	17.9	16	753	6.2	69	26	756	11.4	59		
3,000	30	710	8.1	26	30	713	11.9	52	30	712	8.2	58	26	714	8.7	50	30	713	14.1	17	709	3.4	68	26	712	8.7	58		
4,000	30	629	3.5	25	30	632	5.4	51	30	630	2.4	52	24	632	2.3	48	30	632	7.5	17	626	-2.5	61	24	631	3.0	59		
5,000	30	555	-3.4	24	27	559	-1.3	46	30	556	-4.1	52	22	558	-3.4	49	29	559	0.8	17	551	-8.3	53	24	557	-3.2	50		
6,000	30	488	-9.9	23	27	492	-8.0	44	28	489	-10.4	50	21	490	-9.0	48	29	493	-6.3	17	484	-14.9	51	24	490	-9.3	54		
7,000	28	428	-17.1	23	27	432	-14.7	44	28	429	-17.3	49	20	431	-14.9	39	29	433	-13.4	16	424	-21.2	52	24	430	-15.7	49		
8,000	27	374	-24.9	23	27	377	-21.8	41	28	374	-24.3	46	13	377	-22.1	35	29	379	-21.2	16	368	-28.6	54	24	376	-22.6	47		
9,000	27	324	-32.3	23	27	328	-29.1	39	28	325	-31.8	45	13	327	-29.8	37	29	330	-29.1	16	319	-36.0	54	24	326	-29.8	45		
10,000	27	281	-39.8	23	27	285	-36.8	39	28	282	-39.2	46	12	284	-37.3	33	29	287	-37.2	16	276	-43.5	54	24	284	-37.0	44		
11,000	25	242	-47.1	23	27	246	-44.5	44	28	243	-46.9	9	24	245	-44.9	30	29	248	-44.9	11	237	-49.7	54	24	245	-44.5	54		
12,000	24	208	-53.6	23	27	212	-51.9	48	28	209	-53.5	6	24	212	-52.7	29	213	-51.8	9	203	-54.3	54	24	211	-51.5	54			
13,000	22	177	-57.9	23	27	181	-58.1	48	27	179	-57.9	5	180	-58.7	28	28	182	-57.3	7	173	-55.7	54	24	180	-57.9	54			
14,000	22	151	-59.9	23	27	154	-62.6	48	26	152	-60.0	5	154	-60.5	28	28	155	-61.2	7	147	-57.0	54	24	154	-62.3	54			
15,000	22	128	-61.0	23	27	131	-65.9	48	26	130	-60.9	5	130	-60.9	28	27	132	-64.5	5	125	-67.0	54	24	130	-63.5	54			
16,000	20	109	-62.1	23	26	111	-67.7	48	24	110	-62.1	5	111	-67.7	28	24	112	-67.9	7	113	-65.7	54	24	111	-64.6	54			
17,000	19	93	-62.3	23	23	94	-68.3	48	21	94	-62.0	5	15	-61.6	28	20	95	-70.1	5	80	-67.7	54	24	94	-64.6	54			
18,000	13	79	-61.1	22	22	79	-66.0	48	15	80	-61.6	5	68	-59.5	28	14	80	-67.7	5	78	-60.5	54	24	80	-63.6	54			
19,000	8	67	-59.8	19	13	67	-62.4	48	9	68	-59.5	5	57	-56.6	28	5	57	-56.6	5	77	-62.0	54	24	68	-62.5	54			
20,000	6	57	-55.5	8	8	57	-62.7	48	5	57	-56.6	5	57	-56.6	28	5	57	-56.6	5	67	-54.6	54	24	69	-60.3	54			
21,000																													

Altitude (meters) m. s. l.	Stations and elevations in meters above sea level																		St. Louis, Mo. (171 m.)									
	St. Paul, Minn. (225 m.)				San Antonio, Tex. (175 m.)				San Diego, Calif. ¹ (10 m.)				S. S. Marie, Mich. (221 m.)				Seattle, Wash. ¹ (27 m.)				Spokane, Wash. (598 m.)				Washington, D. C. (25 m.)			
	Number of ob- servations	Pressure	Temperature	Relative humid- ity	Number of ob- servations	Pressure	Temperature	Relative humid- ity	Number of ob- servations	Pressure	Temperature	Relative humid- ity	Number of ob- servations	Pressure	Temperature	Relative humid- ity	Number of ob- servations	Pressure	Temperature	Relative humid- ity	Number of ob- servations	Pressure	Temperature	Relative humid- ity				
Surface	29	987	18.5	77	30	991	27.1	73	30	1,009	16.2	82	30	989	14.9	78	30	957	15.1	73	30	959	13.6	87	29	958	20.2	72
500	29	955	17.7	74	30	955	26.1	74	30	955	19.5	44	30	899	19.5	44	30	902	23.7	70	30	890	10.3	65	29	903	17.7	71
1,000	29	901	15.3	75	30	902	23.7	70	30	899	19.5	44	30	902	20.0	65	30	890	14.0	65	30	893	23.1	73	29	895	15.0	73
1,500	29	850	12.7	76	30	852	21.2	66	30	849	19.9	24	30	850	11.0	65	30	850	7.0	65	30	848	11.2	58	29	853	12.3	76
2,000	29	800	10.3	71	30	804	18.1	65	30	801	18.5	66	30	800	7.8	67	30	799	3.7	68	30	798	7.2	65	29	804	12.3	76
2,500	29	753	7.8	66	30	758	14.9	62	30	754	15.9	14	30	753	5.3	64	30	751	0.5	69	30	751	3.4	73	29	757	9.7	72
3,000	29	709	5.2	62	30	715	12.1	58	30	711	13.3	14	30	708	2.8	60	30	706	-2.5	65	29	706	0.0	79	30	713	7.3	64
4,000	28	627	-0.4	52	30	634	6.5	49	30	631	-0.5	44	30	557	-0.3	20	29	551	-8.1	47	30	546	-14.6	56	29	547	-2.9	51
5,000	28	552	-6.4	46	30	561	0.5	44	30	557	-5.8	37	30	491	-7.4	48	28	484	-14.6	45	28	478	-21.4	61	28	479	-19.2	60
6,000	28	485	-12.9	45	30	494	-5.8	37	30	491	-12.5	34	30	431	-14.7	26	28	423	-21.5	44	28	416	-28.4	63	27	418	-26.2	58
7,000	28	425	-19.4	42	30	434	-12.5	34	30	423	-22.7	32	17	377	-22.7	24	368	-28.8	44	26	361	-35.3	62	27	363	-33.2	57	
8,000	27	370	-27.1	39	30	380	-19.8	32	17	377	-22.7	32	23	319	-30.7	23	319	-36.1	43	25								

TABLE 1.—Mean free-air barometric pressure in millibars, temperature in degrees Centigrade, and relative humidities in percent obtained by airplanes and radiosondes during June 1942—Continued

Altitude (meters) m. s. l.	Stations and elevations in meters above sea level												
	Anchorage Alaska (42 m.)			Barrow, Alaska (6 m.)			Bethel, Alaska, (7 m.)			Fairbanks, Alaska (156 m.)			
	Number of ob- servations	Pressure	Temperature	Number of ob- servations	Pressure	Temperature	Number of ob- servations	Pressure	Temperature	Number of ob- servations	Pressure	Temperature	
Surface	30	1,006	15.7	55	30	1,015	1.6	92	14.8	60	30	990	20.6
500	30	953	12.6	53	30	955	3.2	73	10.5	63	30	951	17.6
1,000	30	898	8.7	57	30	898	4.4	58	6.5	69	30	897	13.2
1,500	30	844	4.9	63	30	844	2.8	60	3.1	75	30	844	9.0
2,000	30	794	1.1	71	30	793	0.6	58	0.2	76	30	795	5.2
2,500	30	746	-2.2	75	30	745	-2.1	58	-0.2	76	30	747	1.3
3,000	30	700	-5.3	75	30	700	-5.2	58	-5.9	74	30	702	-2.2
4,000	30	616	-10.9	71	29	615	-11.1	58	613	-11.7	70	30	618
5,000	30	540	-17.3	68	29	539	-17.3	53	537	-18.1	65	29	543
6,000	28	472	-23.9	66	29	471	-23.8	50	469	-24.4	61	29	475
7,000	26	410	-31.0	64	29	410	-31.0	49	408	-31.4	55	29	413
8,000	24	356	-38.5	60	29	355	-38.4	28	354	-38.5	55	29	359
9,000	24	307	-45.3	57	27	306	-44.7	28	305	-44.9	55	28	310
10,000	23	264	-50.6	57	27	263	-48.4	27	262	-48.0	55	28	267
11,000	23	227	-51.0	57	27	226	-49.0	27	226	-47.0	55	28	229
12,000	22	194	-49.2	57	27	194	-47.1	27	194	-44.9	55	27	196
13,000	21	167	-47.7	57	26	167	-45.4	27	167	-44.4	55	27	168
14,000	20	143	-47.4	57	25	144	-45.2	26	144	-45.0	55	27	144
15,000	19	123	-47.6	57	24	124	-45.2	25	124	-45.5	55	25	124
16,000	18	106	-47.5	57	22	107	-45.1	25	107	-45.6	55	24	107
17,000	18	91	-47.3	57	19	92	-45.0	25	92	-45.4	55	21	92
18,000	16	78	-47.0	57	16	79	-44.4	23	79	-45.0	55	19	78
19,000	15	67	-46.7	57	15	68	-43.5	19	68	-44.6	55	9	68
20,000	10	57	-45.9	57	7	58	-42.5	15	58	-44.1	55	—	—
21,000	8	49	-45.2	57	—	—	7	50	-43.8	55	—	—	—

Altitude (meters) m. s. l. ●	Stations and elevations in meters above sea level											
	Juneau, Alaska (49 m.)			Ketchikan, Alaska (26 m.)			McGrath, Alaska (103 m.)			Nome, Alaska (14 m.)		
	Number of ob- servations	Pressure	Temperature	Number of ob- servations	Pressure	Temperature	Number of ob- servations	Pressure	Temperature	Number of ob- servations	Pressure	Temperature
Surface	30	1,009	15.2	65	30	1,013	14.4	71	30	996	17.9	48
500	30	956	12.0	68	30	957	11.0	74	30	944	14.4	49
1,000	30	901	8.3	74	30	902	7.9	78	30	895	10.1	54
1,500	30	848	4.9	80	30	849	5.0	80	30	842	6.1	61
2,000	30	797	1.7	83	30	798	2.0	79	30	702	2.3	66
2,500	30	749	-0.9	81	30	750	-0.7	76	30	744	-1.1	71
3,000	28	703	-3.6	78	30	704	-3.5	74	30	699	-4.0	72
4,000	27	619	-9.1	74	30	620	-9.0	72	30	615	-10.3	73
5,000	26	543	-14.8	68	27	544	-15.1	69	29	539	-16.7	68
6,000	24	475	-21.3	65	26	476	-21.6	66	29	471	-23.2	66
7,000	23	414	-28.5	62	24	414	-28.5	63	29	410	-30.1	65
8,000	21	359	-36.0	63	24	360	-35.7	61	29	356	-37.3	64
9,000	21	310	-44.0	—	19	311	-43.1	—	29	307	-43.9	—
10,000	19	267	-49.6	—	17	268	-49.4	—	28	264	-47.6	—
11,000	19	229	-50.7	—	13	230	-51.6	—	28	227	-48.2	—
12,000	17	197	-49.6	—	11	197	-51.7	—	27	195	-46.4	—
13,000	17	169	-47.8	—	11	168	-50.6	—	27	168	-45.4	—
14,000	17	145	-47.1	—	10	144	-49.4	—	27	145	-45.5	—
15,000	17	125	-47.0	—	8	124	-49.1	—	25	124	-45.7	—
16,000	17	107	-46.9	—	7	106	-48.6	—	24	107	-45.4	—
17,000	16	92	-46.9	—	—	—	—	—	21	92	-45.2	—
18,000	14	79	-46.7	—	—	—	—	—	18	79	-44.8	—
19,000	12	68	-46.4	—	—	—	—	—	15	68	-44.6	—
20,000	7	59	-45.9	—	—	—	—	—	11	59	-44.4	—
21,000	—	—	—	—	—	—	—	—	5	51	-43.0	—

All observations taken at 11 p. m., 75th meridian time.

None of the means included in this table are based on less than 15 surface or 5 standard level observations.

Number of observations refers to pressure only, as temperature and humidity are missing for some observations at certain levels, also, the humidity data are not used in daily observations when the temperature is below -40° C.

Stations marked with the figure one (1) are Navy stations.

TABLE 2.—Free-air resultant winds based on pilot balloon observations made near 5 p. m. (75th meridian time) during June 1942. Directions given in degrees from North ($N=360^\circ$, $E=90^\circ$, $S=180^\circ$, $W=270^\circ$)—Velocities in meters per second.

Altitude (meters) m. s. l.	Abilene, Tex. (537 m.)		Albu- querque, N. Mex. (1,630 m.)		Atlanta, Ga. (299 m.)		Billings, Mont. (1,095 m.)		Bismarck, N. Dak. (512 m.)		Boise, Idaho (866 m.)		Brownsville, Tex. (7 m.)		Buffalo, N. Y. (220 m.)		Burlington, Vt. (132 m.)		Charleston, S. C. (17 m.)		Cincinnati, Ohio (152 m.)		Denver, Colo. (1,627 m.)		El Paso, Tex. (1,196 m.)																							
	Observations		Direction		Velocity		Observations		Direction		Velocity		Observations		Direction		Velocity		Observations		Direction		Velocity		Observations		Direction		Velocity																			
			Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity																		
Surface	30	154	4.4	30	223	2.6	29	208	0.9	30	348	0.4	30	281	1.8	30	314	3.8	30	120	6.0	29	245	2.5	29	191	1.7	30	154	3.0	30	114	0.5	27	101	2.9	30	253	2.2									
500.	30	157	4.5	30	220	0.7	29	241	1.2	30	320	1.6	30	270	1.6	30	311	4.4	29	154	5.4	29	262	3.2	29	192	2.2	30	151	3.1	30	257	0.4	27	101	2.9	30	253	2.2									
1,000.	30	176	5.1	30	239	3.5	26	302	2.2	30	284	1.4	24	271	3.7	30	316	4.8	29	165	4.1	26	273	2.8	26	275	4.2	26	166	2.8	25	274	4.5	22	279	6.7	23	308	2.2	29	269	3.7	27	112	4.1	30	257	3.4
1,500.	30	197	4.5	30	239	3.5	26	302	2.2	30	284	1.4	24	271	3.7	30	316	4.8	29	165	4.1	26	273	2.8	26	275	4.2	26	166	2.8	25	274	4.5	22	279	6.7	23	308	2.2	29	269	3.7	27	112	4.1	30	257	3.4
2,000.	29	210	2.9	30	235	5.5	23	302	3.2	30	284	3.5	18	263	6.2	30	281	4.7	21	232	1.5	24	274	5.6	21	279	7.4	19	299	1.5	20	273	4.6	27	112	4.1	30	257	3.4									
2,500.	27	230	3.2	30	231	6.3	21	302	4.2	28	252	6.9	14	263	9.2	26	263	1.9	18	293	1.7	18	270	6.9	16	282	7.7	15	238	1.4	15	233	5.5	21	244	4.7	16	268	4.3									
3,000.	25	269	2.9	29	250	7.1	18	273	3.1	22	255	9.8	11	254	10.3	22	248	7.5	15	238	8.7	14	278	3.6	12	280	11.2	15	238	1.4	15	233	5.5	21	244	4.7	16	268	4.3									
4,000.	21	299	3.9	28	265	10.4	12	276	2.6	17	260	9.8	10	260	11.8	20	251	8.7	14	278	3.6	12	280	7.7	15	238	1.4	15	233	5.5	21	244	4.7	16	268	4.3												
5,000.	20	311	4.3	26	270	11.2	12	269	3.5	11	265	12.8	10	247	15.2	20	258	11.6	14	290	4.3	15	276	18.0	13	286	5.8	12	277	22.9	13	274	9.3	15	246	15.6	14	266	9.4									
6,000.	19	315	5.8	21	266	16.4	10	259	3.9	10	259	16.4	10	259	3.9	10	259	16.4	10	259	16.4	10	259	16.4	10	259	16.4	10	259	16.4	10	259	16.4	10	259	16.4	10	259	16.4									
8,000.	16	304	4.4	20	270	27.2	10	259	3.9	10	259	27.2	10	259	3.9	10	259	27.2	10	259	27.2	10	259	27.2	10	259	27.2	10	259	27.2	10	259	27.2	10	259	27.2	10	259	27.2									
10,000.	16	271	7.2	16	271	19.8	10	259	3.9	10	259	19.8	10	259	3.9	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8									
12,000.	16	280	8.1	16	271	19.8	10	259	3.9	10	259	19.8	10	259	3.9	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8									
14,000.	15	275	7.8	16	271	19.8	10	259	3.9	10	259	19.8	10	259	3.9	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8									
16,000.	11	257	5.2	16	271	19.8	10	259	3.9	10	259	19.8	10	259	3.9	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8									
18,000.	11	257	5.2	16	271	19.8	10	259	3.9	10	259	19.8	10	259	3.9	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8	10	259	19.8									
Altitude (meters) m. s. l.	Ely, Nev. (1,910)		Grand Junction, Colo. (1,413 m.)		Greens- boro, N. C. (271 m.)		Havre, Mont. (767 m.)		Jackson- ville, Fla. (16 m.)		Joliet, Ill. (178 m.)		Las Vegas, Nev. (570 m.)		Little Rock, Ark. (88 m.)		Medford, Oreg. (410 m.)		Miami, Fla. (10 m.)		Mobile, Ala. (66 m.)		Nashville, Tenn. (194 m.)		New York, N. Y. (15 m.)																							
	Observations		Direction		Velocity		Observations		Direction		Velocity		Observations		Direction		Velocity		Observations		Direction		Velocity		Observations		Direction		Velocity																			
			Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity																
Surface	30	218	3.2	23	238	1.8	1	0.0	25	274	2.5	2	2.0	29	122	2.0	2	28	250	0.9	30	174	2.9	2	2.9	28	154	2.3	2	2.9	29	176	2.6	30	237	1.1	29	192	0.8									
500.	30	221	3.2	23	238	1.8	1	0.0	25	274	2.5	2	2.0	29	157	2.3	2	28	231	1.1	30	174	2.9	2	2.9	28	132	3.4	2	2.9	29	184	2.6	30	237	2.7	29	239	2.7									
1,000.	30	224	3.5	23	238	2.6	27	284	3.5	24	271	3.9	20	264	2.6	20	285	4.5	30	214	2.1	30	188	3.2	2	2.9	28	177	2.7	2	2.9	29	208	1.7	28	256	3.5											
1,500.	30	224	3.5	23	237	4.5	26	297	3.7	20	262	5.8	18	266	2.2	15	270	5.3	30	214	4.4	24	220	2.3	2	2.9	28	192	2.4	2	2.9	29	227	4.6														
2,000.	28	237	3.7	23	240	5.8	26	290	5.1	14	252	5.8	16	263	2.1	10	275	6.4	30	222	5.2	21	238	3.3	2	2.9	28	204	2.1	18	250	1.6	29	248	4.6													
2,500.	28	299	3.9	22	203	6.7	24	248	4.9	30	218	4.7	30	240	2.4	21	269	4.5	18	241	5.5	29	160	3.9	22	278	3.4	23	287	3.6	20	239	2.6	28	235	3.4	22	275	5.5									
3,000.	28	295	4.6	19	218	6.2	21	257	5.4	30	220	6.2	22	249	6.1	20	271	5.1	14	255	9.1	29	158	2.2	22	271	5.2	20	297	4.7	19	231	2.1	30	228	3.7	26	257	2.8									
4,000.	27	291	7.6	15	242	6.1	16	248	6.7	30	247	8.6	16	263	11.2	17	279	6.0	-----	-----	-----	23	188	1.4	18	251	8.4	11	283	7.3	13	266	2.7	17	272	4.6	11	284	13.0									
5,000.	27	282	9.8	14	257	5.5	11	265	10.5	29	250	9.9	11	258	16.2	12	294	8.8	-----	-----	17	205	1.0	15	256	9.7	10	272	4.6	11	284	13.0																
6,000.	27	279	12.6	12	264	6.9	11	273	11.8	29	251	10.1	11	289	8.7	11	289	8.7	14	311	4.6	13	276																									

Late Reports for Table 2.

Altitude (meters) m. s. l.	MAY 1942			APRIL 1942			Altitude (meters) m. s. l.	MAY 1942			APRIL 1942			
	Boise, Idaho (866 m.)			Chicago, Ill. (192 m.)				Boise, Idaho (866 m.)			Chicago, Ill. (192 m.)			
	Observations	Direction	Velocity	Observations	Direction	Velocity		Observations	Direction	Velocity	Observations	Direction	Velocity	
Surface.....	30	324	2.6	29	186	1.5	2,500.....	27	271	2.8	22	271	5.9	
500.....	30	314	2.8	29	191	2.7	3,000.....	22	255	2.9	20	286	6.6	
1,000.....	30	299	3.4	27	205	3.7	4,000.....	18	239	4.8	17	310	8.9	
1,500.....	30	285	3.5	24	223	3.5	5,000.....	15	275	5.7	14	321	10.8	
2,000.....	29			258		4.8	6,000.....	12	290	7.3	13	329	13.7	

TABLE 3.—Maximum free-air wind velocities (m. p. s.) for different sections of the United States based on pilot-balloon observations during June 1942

Section	Surface to 2,500 meters (m. s. l.)					Between 2,500 and 5,000 meters (m. s. l.)					Above 5,000 meters (m. s. l.)				
	Maximum Velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum Velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum Velocity	Direction	Altitude (m.) m. s. l.	Date	Station
Northeast ¹	31.0	NNW....	1,900	5	Hartford, Conn.....	32.0	WSW....	4,600	23	Boston, Mass.....	56.8	NNW	7,120	20	Boston, Mass.
East-Central ²	34.7	W.....	2,500	13	Nashville, Tenn.....	39.6	WSW....	4,280	24	Richmond, Va.....	49.0	W	11,950	15	Kylertown, Pa.
Southeast ³	23.4	WNW....	2,500	13	Atlanta, Ga.....	29.0	WNW....	3,460	13	Atlanta, Ga.....	43.5	NW	12,820	14	Nashville, Tenn.
North-Central ⁴	45.7	W.....	1,790	21	Duluth, Minn.....	35.8	WSW....	4,090	12	Marquette, Mich.....	58.0	W	16,560	18	Miami, Fla.
Central ⁵	33.2	SW.....	1,580	26	Dodge City, Kans.....	33.8	WNW....	4,350	22	DesMoines, Iowa.....	44.3	WSW....	8,850	17	Huron, S. Dak.
South-Central ⁶	31.4	SE.....	2,490	21	Big Spring, Tex.....	34.9	SE....	2,670	21	Big Spring, Tex.....	43.0	WSW....	12,130	14	St. Louis, Mo.
Northwest ⁷	38.5	WNW....	1,510	19	Billings, Mont.....	33.8	W.....	4,060	16	Billings, Mont.....	58.0	W	13,260	16	San Antonio, Tex.
West-Central ⁸	28.8	W.....	2,500	12	Grand Junction, Colo.....	48.4	WSW....	4,410	11	Casper, Wyo.....	68.8	W	8,770	17	Great Falls, Mont.
Southwest ⁹	38.5	WSW....	2,470	27	Winslow, Ariz.....	38.5	WSW....	3,370	27	Winslow, Ariz.....	79.2	WSW....	9,040	17	Reno, Nev.
															Winslow, Ariz.

¹ Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, and northern Ohio.² Delaware, Maryland, Virginia, West Virginia, southern Ohio, Kentucky, eastern Tennessee, and North Carolina.³ South Carolina, Georgia, Florida, and Alabama.⁴ Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.⁵ Indiana, Illinois, Iowa, Nebraska, Kansas, and Missouri.⁶ Mississippi, Arkansas, Louisiana, Oklahoma, Texas (except El Paso), and western Tennessee.⁷ Montana, Idaho, Washington, and Oregon.⁸ Wyoming, Colorado, Utah, northern Nevada, and northern California.⁹ Southern California, southern Nevada, Arizona, New Mexico, and extreme west Texas.

RIVER STAGES AND FLOODS

By BENNETT SWENSON

Precipitation during June was above normal throughout the country except for a few scattered areas. The greatest exception was the far Southwest where a large area, for the second consecutive month, received little or no precipitation. The driest states for the two months of May and June were Arizona and New Mexico. On the other hand, the Plains States had an abundance of rain during June, and for the first 6 months of the year precipitation was generally well above normal in this area.

Extensive floods occurred in the Plains States from South Dakota to Texas from frequent, and at times heavy, rains; and local floods resulted in northern New England from unusually heavy thunderstorms near the middle of the month. The Missouri River from Blair, Nebr., to its mouth and most of the Mississippi River above Cairo, Ill., were in flood. The Mississippi and Missouri River floods combined at St. Louis to produce unusually high stages between that point and Cairo, Ill.

Atlantic Slope drainage.—High stages occurred in the Presumpscot, Androscoggin and Kennebec River Basins in Maine as the result of rainfall of high intensities during the period June 14–18. The storm occurred in two phases, causing two crests on most streams. The peak stages were not unusually high but damage was caused in some sections by the heavy rainfall and resultant floods, especially to crops and highways.

Intense rainfall on the afternoon and evening of June 14, in the upper Connecticut and Merrimack River

Basins produced unusually rapid rises in some of the tributary streams in New Hampshire. In the Connecticut Basin, Oliverian Brook, between Glencliff and East Haverhill, N. H., overflowed causing severe damage to highways and bridges and Mascoma River flooded the streets of Canaan, N. H. The upper reach of the Connecticut River, immediately below Pittsburgh Reservoir overflowed causing damage to the extent of \$40,000. At Hartford, Conn., the river rose 7 feet above the stage on the 15th, reaching a crest of 10.2 feet on the 18th.

In the Merrimack River Basin above Nashua, N. H., rains beginning about 3 p. m., June 14, and continuing for 12 hours averaged 3.75 inches. The greatest amounts were concentrated in the Bakers River Valley and in the upper portion of Smith River, where over 8 inches of rain occurred, resulting in serious flooding in these rivers. At Rumney, N. H., Bakers River reached a peak stage of 15.5 feet on June 15, exceeding the floods of March 1936 and September 1938 and second only to the flood of 1927 at that station. The Pemigewasset River was in moderate flood at and above Plymouth, N. H. Elsewhere in the Merrimack Basin, flows did not reach flood proportions. Damages, the greater part of which occurred in the Bakers River area, have been estimated at \$53,000.

In the remainder of the Atlantic Slope drainage, showers on June 14 in the upper Susquehanna River Basin were sufficiently heavy to raise that river slightly above flood stage at Oneonta, N. Y., and heavy showers on June 10–11 over the Roanoke River Basin caused slight flooding at Randolph, Va., and Weldon, N. C., but stages were not sufficiently high to cause damage.